WHAT IS CLAIMED IS:

1. A method of increasing the binding of an oligomeric compound to proteins comprising preparing said oligomeric compound having at least one group of formula I:

$$—O—(CH_2)_n—J$$

(I)

wherein:

each n is, independently, from 1 to about 10;

each J is, independently, a sulfonic acid (-S(=O)$_2$OH), a sulfonate salt (-S(=O)$_2$O$^-$X$^+$), a sulfoxide (-S(=O)-Z), a sulfone (-S(=O)$_2$-Z), -SH, -S-S-Z, or a thiol (-S-Z);

each X$^+$ is a metal cation;

each Z is, independently, selected from the group consisting of substituted or unsubstituted C_1-C_{20} alkyl, substituted or unsubstituted C_2-C_{20} alkenyl, substituted or unsubstituted C_2-C_{20} alkynyl, substituted or unsubstituted C_5-C_{20} aryl wherein said substitution is alkyl or aryl;

covalently attached thereto thereby providing an enhanced oligomeric compound.

2. The method of claim 1 wherein at least one n is 2.

3. The method of claim 1 wherein said oligomeric compound comprises at least two groups of formula I.

4. The method of claim 1 wherein said protein is serum albumin.

5. The method of claim 1 wherein said protein is human serum albumin.

6. The method of claim 1 wherein J is -S-Z and Z is a straight or branched C_1 to C_{20} alkyl group.

7. The method of claim 6 wherein said alkyl group is methyl, ethyl or propyl.

8. The method of claim 7 wherein said alkyl group is methyl.

9. The method of claim 1 wherein J is -S-Z and Z is aryl having from 5 to about 14 carbon atoms.

10. The method of claim 9 wherein Z is phenyl.

11. The method of claim 1 wherein at least one J is a sulfonic acid.

12. The method of claim 1 wherein at least one J is a sulfonate salt.

13. The method of claim 12 wherein X^+ is Na+.

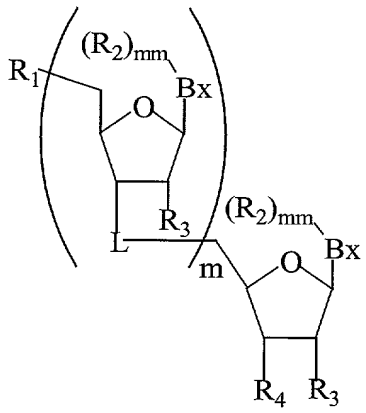
14. The method of claim 1 wherein at least one J is a sulfoxide.

15. The method of claim 14 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

16. The method of claim 1 wherein at least one J is a sulfone.

17. The method of claim 16 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

18. The method of claim 1 wherein said enhanced oligomeric compound has formula II:



(II)

wherein:

each Bx is, independently, an optionally protected heterocyclic base moiety;

R_1 is hydrogen, hydroxyl, a protected hydroxyl, a nucleoside, a nucleotide, an oligonucleoside, an oligonucleotide or a group of formula I;

R_4 is hydrogen, hydroxyl, a protected hydroxyl, a nucleoside, a nucleotide, an oligonucleoside, an oligonucleotide or a group of formula I;

each R_2 is a group of formula I;

each R_3 is, independently, hydrogen, hydroxyl, a protected hydroxyl, an optionally protected sugar substituent group or a group of formula I;

L is an internucleoside linking group;

m is from 3 to about 50; and

each mm is, independently, 0 or 1;

wherein at least one R_1, R_2, R_3 or R_4 is a group of formula I.

19. The method of claim 18 wherein said internucleoside linking group is a phosphorus-containing internucleoside linking group.

20. The method of claim 19 wherein said internucleoside linking group is a phosphodiester, a phosphorothioate or a phosphorodithioate.

21. The method of claim 18 wherein m is from about 8 to about 30.

22. The method of claim 18 wherein m is from about 15 to about 25.

23. The method of claim 18 wherein each mm is 0.

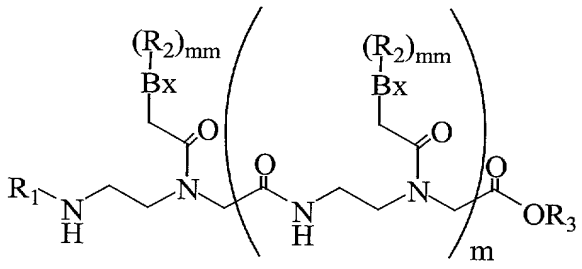
24. The method of claim 18 wherein at least two of said R_1, R_2, R_3 and R_4 are groups of formula I.

25. The method of claim 18 wherein substantially all R_3 are groups of formula I.

26. The method of claim 18 wherein R_1 is a group of formula I.

27. The method of claim 18 wherein R_4 is a group of formula I.

28. The method of claim 1 wherein said oligomeric compound has the formula III:



(III)

wherein

each Bx is an optionally protected heterocyclic base moiety;

R_1 is hydrogen or an amino protecting group;

each R_2 is a group of formula I;

R_3 is hydrogen or a hydroxyl protecting group;

m is from 3 to about 50; and

each mm is, independently, 0 or 1 with the proviso that at least one mm is 1.

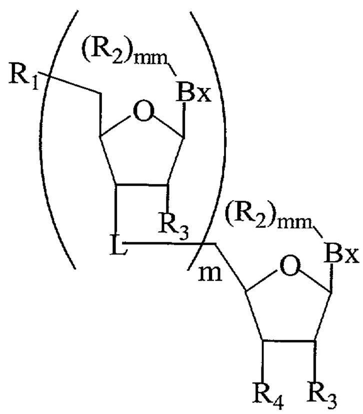
29. The method of claim 28 wherein m is from about 8 to about 30.

30. The method of claim 28 wherein m is from about 15 to about 25.

31. The method of claim 28 wherein at least two of said mm are 1.

32. The method of claim 28 wherein essentially each mm is 1.

33. A compound of formula II:



(II)

wherein:

each Bx is an optionally protected heterocyclic base moiety;

R_1 is hydrogen, hydroxyl, a protected hydroxyl, a nucleoside, a nucleotide, an oligonucleoside, an oligonucleotide or a group of formula I;

R_4 is hydrogen, hydroxyl, a protected hydroxyl, a nucleoside, a nucleotide, an oligonucleoside, an oligonucleotide or a group of formula I;

each R_2 is a group of formula I:

$$—O—(CH_2)_n—J$$

(I)

wherein:

each n is, independently, from 1 to about 10;

each J is, independently, a sulfonic acid ($-S(=O)_2OH$), a sulfonate salt ($-S(=O)_2O^-X^+$), a sulfoxide ($-S(=O)-Z$), a sulfone ($-S(=O)_2-Z$), -SH, -S-S-Z, or a thiol (-S-Z);

each X^+ is a metal cation;

each Z is, independently, selected from the group consisting of C_1-C_{20} alkyl, C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, C_5-C_{20} aryl and C_5-C_{20} aryl substituted C_1-C_{20} alkyl;

each R_3 is, independently, hydrogen, hydroxyl, a protected hydroxyl, an optionally protected sugar substituent group or a group of formula I;
L is an internucleoside linking group;
m is from 3 to about 50; and
each mm is, independently, 0 or 1;
wherein at least one of said L is other than a phosphodiester internucleoside linkage and at least one of said R_1, R_2, R_3 and R_4 is a group of formula I.

34. The compound of claim 33 wherein at least one R_3 is an optionally protected sugar substituent group.

35.The compound of claim 33 wherein at least two of said R_1, R_2, R_3 and R_4 are groups of formula I.

36. The compound of claim 35 wherein at least two of said R_3 are, independently, groups of formula I.

37. The compound of claim 33 wherein substantially all R_3 are groups of formula I.

38. The compound of claim 33 wherein R_1 is a group of formula I.

39. The compound of claim 33 wherein R_4 is a group of formula I.

40. The compound of claim 33 wherein J is -S-Z and Z is a straight or branched C_1 to C_{20} alkyl group.

41. The compound of claim 40 wherein said alkyl group is methyl, ethyl or propyl.

42. The compound of claim 41 wherein said alkyl group is methyl.

43. The compound of claim 33 wherein J is -S-Z and Z is aryl having from 5 to about 14 carbon atoms.

44. The compound of claim 33 wherein Z is phenyl.

45. The compound of claim 33 wherein at least one J is a sulfonic acid.

46. The compound of claim 33 wherein at least one J is a sulfonate salt.

47. The compound of claim 46 wherein X^+ is Na^+.

48. The compound of claim 33 wherein at least one J is a sulfoxide.

49. The compound of claim 48 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

50. The compound of claim 33 wherein at least one J is a sulfone.

51. The compound of claim 50 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

52. The compound of claim 33 wherein said internucleoside linking group is a phosphorus-containing internucleoside linking group.

53. The compound of claim 52 wherein said internucleoside linking group is a phosphodiester, a phosphorothioate or a phosphorodithioate.

54. The compound of claim 33 wherein m is from about 8 to about 30.

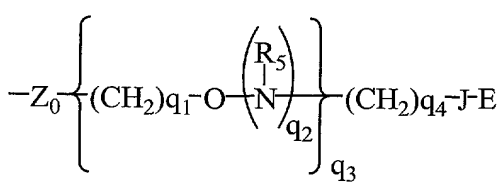
55. The compound of claim 33 wherein m is from about 15 to about 25.

56. The compound of claim 33 wherein each mm is 0.

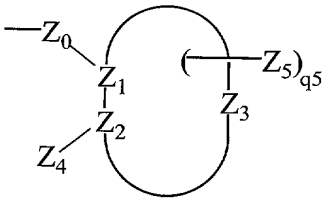
57. The compound of claim 33 wherein n is 2.

58. The compound of claim 33 wherein each of said Bx is independently selected from the group consisting of adenine, guanine, thymine, cytosine, uracil, 5-methylcytosine (5-me-C), 5-hydroxymethyl cytosine, xanthine, hypoxanthine, 2-aminoadenine, alkyl derivatives of adenine and guanine, 2-thiouracil, 2-thiothymine, 2-thiocytosine, 5-halouracil, 5-halocytosine, 5-propynyl uracil, 5-propynyl cytosine, 6-azo uracil, 6-azo cytosine, 6-azo thymine, 5-uracil (pseudouracil), 4-thiouracil, 8-substituted adenines and guanines, 5-substituted uracils and cytosines, 7-methylguanine, 7-methyladenine, 8-azaguanine, 8-azaadenine, 7-deazaguanine, 7-deazaadenine, 3-deazaguanine and 3-deazaadenine.

59. The compound of claim 33 wherein each optionally protected sugar substituent groups is, independently, C_1-C_{20} alkyl, C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, C_5-C_{20} aryl, -*O*-alkyl, -*O*-alkenyl, -*O*-alkynyl, -*O*-alkylamino, -*O*-alkylalkoxy, -*O*-alkylaminoalkyl, -*O*-alkyl imidazole, -OH, -SH, -S-alkyl, -S-alkenyl, -S-alkynyl, -N(H)-alkyl, -N(H)-alkenyl, -N(H)-alkynyl, -N(alkyl)$_2$, -*O*-aryl, -S-aryl, -NH-aryl, -*O*-aralkyl, -S-aralkyl, -N(H)-aralkyl, phthalimido (attached at N), halogen, amino, keto (-C(=O)-R), carboxyl (-C(=O)OH), nitro (-NO_2), nitroso (-N=O), cyano (-CN), trifluoromethyl (-CF_3), trifluoromethoxy (-*O*-CF_3), imidazole, azido (-N_3), hydrazino (-N(H)-NH_2), aminooxy (-*O*-NH_2), isocyanato (-N=C=O), sulfoxide (-S(=O)-R), sulfone (-S(=O)$_2$-R), disulfide (-S-S-R), silyl, heterocycle, carbocycle, intercalator, reporter group, conjugate, polyamine, polyamide, polyalkylene glycol, and polyethers of the formula (-*O*-alkyl)$_m$, where m is 1 to about 10;
wherein each R is, independently, hydrogen, a protecting group or substituted or unsubstituted alkyl, alkenyl, or alkynyl wherein said substituted alkyl, alkenyl, or alkynyl are substituted with haloalkyl, alkenyl, alkoxy, thioalkoxy, haloalkoxy, aryl groups as well as halogen, hydroxyl, amino, azido, carboxy, cyano, nitro, mercapto, sulfides, sulfones, and sulfoxides;
or each sugar substituent group has one of formula VI or VII:
wherein:



VI

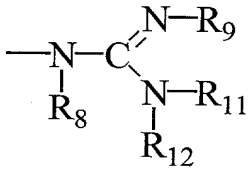


VII

Z_0 is O, S or NH;

J is a single bond, O or C(=O);

E is C_1-C_{10} alkyl, $N(R_5)(R_6)$, $N(R_5)(R_7)$, $N=C(R_{5a})(R_{6a})$, $N=C(R_{5a})(R_{7a})$ or has formula IX;



IX

each R_8, R_9, R_{11} and R_{12} is, independently, hydrogen, $C(O)R_{13}$, substituted or unsubstituted C_1-C_{10} alkyl, substituted or unsubstituted C_2-C_{10} alkenyl, substituted or unsubstituted C_2-C_{10} alkynyl, alkylsulfonyl, arylsulfonyl, a chemical functional group or a conjugate group, wherein the substituent groups are selected from hydroxyl, amino, alkoxy, carboxy, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl and alkynyl;

or optionally, R_{11} and R_{12}, together form a phthalimido moiety with the nitrogen atom to which they are attached;

each R_{13} is, independently, substituted or unsubstituted C_1-C_{10} alkyl, trifluoromethyl, cyanoethyloxy, methoxy, ethoxy, t-butoxy, allyloxy, 9-fluorenylmethoxy, 2-(trimethylsilyl)-ethoxy, 2,2,2-trichloroethoxy, benzyloxy, butyryl, iso-butyryl, phenyl or aryl;

R_5 is hydrogen, a nitrogen protecting group or -T-L,

R_{5a} is hydrogen, a nitrogen protecting group or -T-L,

T is a bond or a linking moiety;

L is a chemical functional group, a conjugate group or a solid support material;

each R_6 and R_7 is, independently, H, a nitrogen protecting group, substituted or unsubstituted C_1-C_{10} alkyl, substituted or unsubstituted C_2-C_{10} alkenyl, substituted or

unsubstituted C_2-C_{10} alkynyl, wherein said substitution is hydroxyl, amino, alkoxy, carboxy, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl, alkynyl; NH_3^+, $N(R_{14})(R_{15})$, guanidino or acyl where said acyl is an acid amide or an ester;

or R_6 and R_7, together, are a nitrogen protecting group, are joined in a ring structure that optionally includes an additional heteroatom selected from N and O or are a chemical functional group;

each R_{14} and R_{15} is, independently, H, C_1-C_{10} alkyl, a nitrogen protecting group, or R_{14} and R_{15}, together, are a nitrogen protecting group;

or R_{14} and R_{15} are joined in a ring structure that optionally includes an additional heteroatom selected from N and O;

Z_4 is OX, SX or $N(X)_2$;

each X is, independently, H, C_1-C_8 alkyl, C_1-C_8 haloalkyl, $C(=NH)N(H)R_{16}$, $C(=O)N(H)R_{16}$ or $OC(=O)N(H)R_{16}$;

R_{16} is H or C_1-C_8 alkyl;

Z_1, Z_2 and Z_3 comprise a ring system having from about 4 to about 7 carbon atoms or having from about 3 to about 6 carbon atoms and 1 or 2 heteroatoms wherein said heteroatoms are selected from oxygen, nitrogen and sulfur and wherein said ring system is aliphatic, unsaturated aliphatic, aromatic, or saturated or unsaturated heterocyclic;

Z_5 is alkyl or haloalkyl having 1 to about 10 carbon atoms, alkenyl having 2 to about 10 carbon atoms, alkynyl having 2 to about 10 carbon atoms, aryl having 6 to about 14 carbon atoms, $N(R_5)(R_6)$ OR_5, halo, SR_5 or CN;

each q_1 is, independently, an integer from 1 to 10;

each q_2 is, independently, 0 or 1;

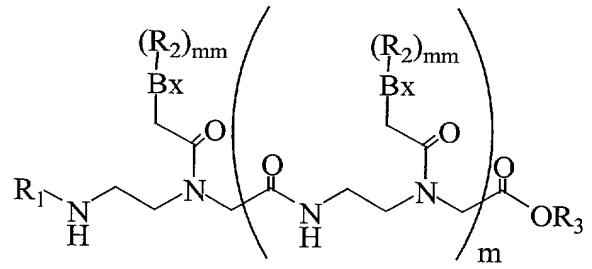
q_3 is 0 or an integer from 1 to 10;

q_4 is an integer from 1 to 10;

q_5 is from 0, 1 or 2; and

provided that when q_3 is 0, q_4 is greater than 1.

60. A compound of formula III:



(III)

wherein:

each Bx is, independently, an optionally protected heterocyclic base moiety;

R_1 is hydrogen or an amino protecting group;

R_3 is hydrogen or a hydroxyl protecting group;

each R_2 is a compound of formula I;

—O—$(CH_2)_n$—J

(I)

wherein:

each n is, independently, from 1 to about 10;

each J is, independently, a sulfonic acid (-S(=O)$_2$OH), a sulfonate salt (-S(=O)$_2$O$^-$X$^+$), a sulfoxide (-S(=O)-Z), a sulfone (-S(=O)$_2$-Z), -SH, -S-S-Z, or a thiol (-S-Z);

each X^+ is a metal cation;

each Z is, independently, selected from the group consisting of substituted or unsubstituted C_1-C_{20} alkyl, substituted or unsubstituted C_2-C_{20} alkenyl, substituted or unsubstituted C_2-C_{20} alkynyl, substituted or unsubstituted C_5-C_{20} aryl wherein said substitution is alkyl or aryl;

m is from 3 to about 50; and

each mm is, independently, 0 or 1 with the proviso that at least one mm is 1.

61. The compound of claim 60 wherein J is -S-Z and Z is a straight or branched C_1 to C_{20} alkyl group.

62. The compound of claim 61 wherein said alkyl group is methyl, ethyl or propyl.

63. The compound of claim 62 wherein said alkyl group is methyl.

64. The compound of claim 60 wherein Z is aryl having from 6 to about 14 carbon atoms.

65. The compound of claim 64 wherein Z is phenyl.

66. The compound of claim 60 wherein Z is sulfonyl.

67. The compound of claim 60 wherein n is 2.

68. The compound of claim 60 wherein m is from about 8 to about 30.

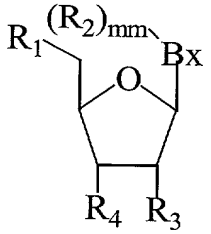
69. The compound of claim 60 wherein m is from about 15 to about 25.

70. The compound of claim 60 wherein at least two R_2 are groups of formula I.

71. The compound of claim 60 wherein substantially all R_2 are groups of formula I.

72. The compound of claim 60 wherein each of said Bx is independently selected from the group consisting of adenine, guanine, thymine, cytosine, uracil, 5-methylcytosine (5-me-C), 5-hydroxymethyl cytosine, xanthine, hypoxanthine, 2-aminoadenine, alkyl derivatives of adenine and guanine, 2-thiouracil, 2-thiothymine, 2-thiocytosine, 5-halouracil, 5-halocytosine, 5-propynyl uracil, 5-propynyl cytosine, 6-azo uracil, 6-azo cytosine, 6-azo thymine, 5-uracil (pseudouracil), 4-thiouracil, 8-substituted adenines and guanines, 5-substituted uracils and cytosines, 7-methylguanine, 7-methyladenine, 8-azaguanine, 8-azaadenine, 7-deazaguanine, 7-deazaadenine, 3-deazaguanine and 3-deazaadenine.

73.. A compound of formula IV:



(IV)

wherein:

each Bx is, independently, an optionally protected heterocyclic base moiety;

R_1 is hydrogen, hydroxyl, a protected hydroxyl, a leaving group or a group of formula I;

$$—O—(CH_2)_n—J$$

(I)

wherein:

each n is, independently, from 1 to about 10;

each J is, independently, a sulfonic acid ($-S(=O)_2OH$), a sulfonate salt ($-S(=O)_2O^-X^+$), a sulfoxide ($-S(=O)-Z$), a sulfone ($-S(=O)_2-Z$), -SH, -S-S-Z, or a thiol (-S-Z);

each X^+ is a metal cation;

each Z is, independetly, selected from the group consisting of substituted or unsubstituted C_1-C_{20} alkyl, substituted or unsubstituted C_2-C_{20} alkenyl, substituted or unsubstituted C_2-C_{20} alkynyl, substituted or unsubstituted C_5-C_{20} aryl wherein said substitution is alkyl or aryl;

R_4 is hydrogen, hydroxyl, a protected hydroxyl, an optionally protected sugar substituent group or a group of formula I;

R_2 is a group of formula I;

R_3 is hydrogen, hydroxyl, a protected hydroxyl, an optionally protected sugar substituent group or a group of formula I;

mm is 0 or 1;

wherein at least one R_1, R_2, R_3 or R_4 is a group of formula I.

74. The compound of claim 73 wherein J is -S-Z and Z is C_1-C_{20} alkyl.

75. The compound of claim 74 wherein said alkyl is methyl, ethyl or propyl.

76. The compound of claim 74 wherein said alkyl group is methyl.

77. The compound of claim 73 wherein J is -S-Z and Z is aryl having from 6 to about 14 carbon atoms.

78. The compound of claim 77 wherein Z is phenyl.

79. The compound of claim 73 wherein Z is sulfonyl.

80. The compound of claim 73 wherein n is 2.

81. The compound of claim 73 wherein mm is 0.

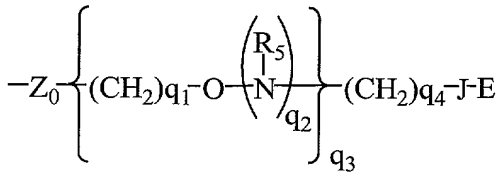
82. The compund of claim 73 wherein each of said Bx is independently selected from the group consisting of adenine, guanine, thymine, cytosine, uracil, 5-methylcytosine (5-me-C), 5-hydroxymethyl cytosine, xanthine, hypoxanthine, 2-aminoadenine, alkyl derivatives of adenine and guanine, 2-thiouracil, 2-thiothymine, 2-thiocytosine, 5-halouracil, 5-halocytosine, 5-propynyl uracil, 5-propynyl cytosine, 6-azo uracil, 6-azo cytosine, 6-azo thymine, 5-uracil (pseudouracil), 4-thiouracil, 8-substituted adenines and guanines, 5-substituted uracils and cytosines, 7-methylguanine, 7-methyladenine, 8-azaguanine, 8-azaadenine, 7-deazaguanine, 7-deazaadenine, 3-deazaguanine and 3-deazaadenine.

83. The method of claim 73 wherein each optionally protected sugar substituent groups is, independently, C_1-C_{20} alkyl, C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, C_5-C_{20} aryl, -*O*-alkyl, -*O*-alkenyl, -*O*-alkynyl, -*O*-alkylamino, -*O*-alkylalkoxy, -*O*-alkylaminoalkyl, -*O*-alkyl imidazole, -OH, -SH, -S-alkyl, -S-alkenyl, -S-alkynyl, -N(H)-alkyl, -N(H)-alkenyl, -N(H)-alkynyl, -N(alkyl)$_2$, -*O*-aryl, -S-aryl, -NH-aryl, -*O*-aralkyl, -S-aralkyl, -N(H)-aralkyl, phthalimido (attached at N), halogen, amino, keto (-C(=O)-R), carboxyl (-C(=O)OH), nitro (-NO_2), nitroso (-N=O), cyano (-CN), trifluoromethyl (-CF_3), trifluoromethoxy (-*O*-CF_3), imidazole, azido (-N_3), hydrazino (-N(H)-NH_2), aminooxy (-*O*-NH_2), isocyanato (-N=C=O), sulfoxide (-S(=O)-R), sulfone (-S(=O)$_2$-

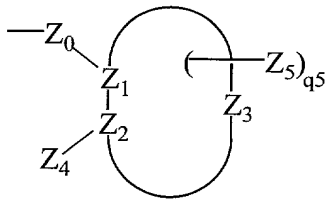
R), disulfide (-S-S-R), silyl, heterocycle, carbocycle, intercalator, reporter group, conjugate, polyamine, polyamide, polyalkylene glycol, and polyethers of the formula (-*O*-alkyl)$_m$, where m is 1 to about 10;

wherein each R is, independently, hydrogen, a protecting group or substituted or unsubstituted alkyl, alkenyl, or alkynyl wherein said substituted alkyl, alkenyl, or alkynyl are substituted with haloalkyl, alkenyl, alkoxy, thioalkoxy, haloalkoxy, aryl groups as well as halogen, hydroxyl, amino, azido, carboxy, cyano, nitro, mercapto, sulfides, sulfones, and sulfoxides;

or each sugar substituent group has one of formula VI or VII:



VI



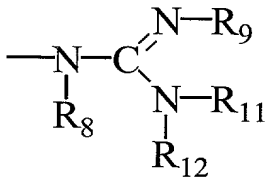
VII

wherein:

Z_0 is O, S or NH;

J is a single bond, O or C(=O);

E is C_1-C_{10} alkyl, $N(R_5)(R_6)$, $N(R_5)(R_7)$, $N=C(R_{5a})(R_{6a})$, $N=C(R_{5a})(R_{7a})$ or has formula IX;



IX

Wherein

each R_8, R_9, R_{10}, R_{11} and R_{12} is, independently, hydrogen, $C(O)R_{13}$, substituted or unsubstituted C_1-C_{10} alkyl, substituted or unsubstituted C_2-C_{10} alkenyl, substituted or unsubstituted C_2-C_{10} alkynyl, alkylsulfonyl, arylsulfonyl, a chemical functional group or a conjugate group, wherein the substituent groups are selected from hydroxyl, amino, alkoxy, carboxy, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl and alkynyl;

or optionally, R_9 and R_{10}, together form a phthalimido moiety with the nitrogen atom to which they are attached;

or optionally, R_{11} and R_{12}, together form a phthalimido moiety with the nitrogen atom to which they are attached;

each R_{13} is, independently, substituted or unsubstituted C_1-C_{10} alkyl, trifluoromethyl, cyanoethyloxy, methoxy, ethoxy, t-butoxy, allyloxy, 9-fluorenylmethoxy, 2-(trimethylsilyl)-ethoxy, 2,2,2-trichloroethoxy, benzyloxy, butyryl, iso-butyryl, phenyl or aryl;

R_5 is hydrogen, a nitrogen protecting group or -T-L,

R_{5a} is hydrogen, a nitrogen protecting group or -T-L,

T is a bond or a linking moiety;

L is a chemical functional group, a conjugate group or a solid support material;

each R_6 and R_7 is, independently, H, a nitrogen protecting group, substituted or unsubstituted C_1-C_{10} alkyl, substituted or unsubstituted C_2-C_{10} alkenyl, substituted or unsubstituted C_2-C_{10} alkynyl, wherein said substitution is hydroxyl, amino, alkoxy, carboxy, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl, alkynyl; NH_3^+, $N(R_{14})(R_{15})$, guanidino or acyl where said acyl is an acid amide or an ester;

or R_6 and R_7, together, are a nitrogen protecting group, are joined in a ring structure that optionally includes an additional heteroatom selected from N and O or are a chemical functional group;

each R_{14} and R_{15} is, independently, H, C_1-C_{10} alkyl, a nitrogen protecting group, or R_{14} and R_{15}, together, are a nitrogen protecting group;

or R_{14} and R_{15} are joined in a ring structure that optionally includes an additional heteroatom selected from N and O;

Z_4 is OX, SX or $N(X)_2$;

each X is, independently, H, C_1-C_8 alkyl, C_1-C_8 haloalkyl, $C(=NH)N(H)R_{16}$, $C(=O)N(H)R_{16}$ or $OC(=O)N(H)R_{16}$;

R_{16} is H or C_1-C_8 alkyl;

Z_1, Z_2 and Z_3 comprise a ring system having from about 4 to about 7 carbon atoms or having from about 3 to about 6 carbon atoms and 1 or 2 heteroatoms wherein said heteroatoms are selected from oxygen, nitrogen and sulfur and wherein said ring

system is aliphatic, unsaturated aliphatic, aromatic, or saturated or unsaturated heterocyclic;

Z_5 is alkyl or haloalkyl having 1 to about 10 carbon atoms, alkenyl having 2 to about 10 carbon atoms, alkynyl having 2 to about 10 carbon atoms, aryl having 6 to about 14 carbon atoms, $N(R_5)(R_6)$ OR_5, halo, SR_5 or CN;

each q_1 is, independently, an integer from 1 to 10;

each q_2 is, independently, 0 or 1;

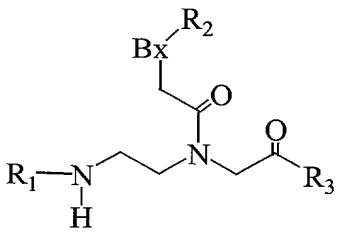
q_3 is 0 or an integer from 1 to 10;

q_4 is an integer from 1 to 10;

q_5 is from 0, 1 or 2; and

provided that when q_3 is 0, q_4 is greater than 1.

84. A compound of formula V:



(V)

wherein:

Bx is an optionally protected heterocyclic base moiety;

R_1 is hydrogen, hydroxyl or a protected hydroxyl group;

R_2 is a group of formula I:

$—O—(CH_2)_n—J$

(I)

wherein:

n is from 1 to about 10;

J is a sulfonic acid

($-S(=O)_2OH$), a sulfonate salt ($-S(=O)_2O^-X^+$), a sulfoxide (-S(=O)-Z), a sulfone ($-S(=O)_2-Z$), -SH, -S-S-Z, or a thiol (-S-Z);

X^+ is a metal cation;

Z is selected from the group consisting of substituted or unsubstituted C_1-C_{20} alkyl, substituted or unsubstituted C_2-C_{20} alkenyl, substituted or unsubstituted C_2-C_{20} alkynyl, substituted or unsubstituted C_5-C_{20} aryl wherein said substitution is alkyl or aryl; and

R_3 is hydrogen or an amino protecting group.

85. The compound of claim 84 wherein J is -S-Z and Z is a straight or branched C_1 to C_{20} alkyl group.

86. The compound of claim 85 wherein said alkyl group is methyl, ethyl or propyl.

87. The compound of claim 86 wherein said alkyl group is methyl.

88. The compound of claim 84 wherein J is -S-Z and Z is aryl having from 6 to about 14 carbon atoms.

89. The compound of claim 84 wherein J is -S-Z and Z is phenyl.

90. The compound of claim 84 wherein J is a sulfonic acid.

91. The compound of claim 84 wherein J is a sulfonate salt.

92. The compound of claim 91 wherein X^+ is Na+.

93. The compound of claim 84 wherein J is a sulfoxide.

94. The compound of claim 93 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

95. The compound of claim 84 wherein J is a sulfone.

96. The compound of claim 95 wherein Z is substituted or unsubstituted C_1-C_{20} alkyl or substituted or unsubstituted C_5-C_{20} aryl.

97. The compound of claim 84 wherein J is sulfonyl.

98. The compound of claim 84 wherein n is 2.

99. The compound of claim 84 wherein mm is 0.